

REMARKS

Entry and consideration of this Response, and further consideration of this application courteously are solicited. This solicitation is made pursuant to 37 C.F. R. §1.116.

Paper No. 16 objected to claim 6 on the basis of informality. This claim has been amended as required. In addition, the description "common jacket on the outside" is changed to --said common outer jacket -- in order to be completely consistent with the "common outer jacket" introduced in claim 4. Claim 6, of course, depends from claim 4.

Paper No.16 has maintained the allowance of claims 2, 9, 12, 13 and 15. Likewise, Paper No. 16 maintains that claims 31 and 32 contain allowable subject matter. The Examiner's indications of allowance and allowability are appreciated.

Over previous Office Actions, Paper No. 16 rejects claims 1, 10, 14, 16, 19-22, 25-27 and 30 under new grounds. Likewise, claims 4, 6, 17, 24 and 29; claims 5, 7 and 18; claim 8; claim 11; and claim 33 likewise are rejected under new grounds. The newly-stated reasons for the rejections commonly depend upon U.S. Patent 5,061,823 to Carroll. All of these rejections are traversed in view of the following.

Initially, no amendment is made to any of rejected independent claims 1, 16, 22 and 33 in order to address and overcome the new rejections. The rejections are traversed because the Carroll patent does not remedy the deficiencies of the Katsumata, et al., and where cited, the other applied patents, with respect to the independent claims. Moreover, Applicants respectfully submit that even if the Carroll patent would remedy these deficiencies, the Carroll patent is not properly combinable with Katsumata, et al. and such other applied patents because such combinations improperly rely upon hindsight gleaned only from Applicants' specification.

In discussing the rejections in detail, reference will be made to independent claims 1 and 33 as exemplary of the independent claims at issue. Claim 1 calls for a center conductor, a conductive insulation layer provided around the center conductor, and an outer conductor. Claim 1 sets forth details of the thickness of the insulation layer. It also

provides further details concerning the outer conductor. At particular issue, with respect to the Carroll patent, claim 1 defines the outer conductor as a helically wrapped ribbon-shaped conductor that is wrapped around the insulation layer at a wrapping angle that is more than 45°.

Claim 33 simply recites Applicants' coaxial element wire as comprising the center conductor, the insulation layer provided around the center conductor, and then the outer conductor, without details of the center conductor and the insulation layer. On the other hand, details of the outer conductor are provided in that it likewise is defined as helically wrapped around the insulation layer at a wrapping angle with respect to the axial axis of the coaxial element wire of more than 45°. Additionally, details of the shape and manner of wrapping of the outer conductor are set forth.

Each of independent claims 1 and 33 reads on Applicants' exemplary, preferred embodiment of Figure 1. By way of review, the Figure 1 embodiment includes core conductor 1, surrounded by insulation layer 2. Directly over the insulation, is wrapped the ribbon-shaped conductor at a wrapping angle greater than 45°. Over top of the ribbon-shaped conductor is provided the outer jacket 4.

As compared to Applicants' exemplary embodiment of Figure 1, and claims 1 and 33, the Katsumata, et al. patent (Fig. 7(a)) likewise shows an inner conductor 111 surrounded by an insulator 112. Over the insulator 112 is a spirally, or helically, wrapped outer conductor that Katsumata, et al. refer to as their "drain wire." As clear from the prosecution of this application to date, Katsumata, et al. do not, however, teach or suggest that the drain wire or outer conductor 113 be wrapped around the insulator 112 at a wrapping angle greater than 45° with respect to the axial axis of the coaxial wire (the axial axis being represented, for instance, by the center conductor 111 of Katsumata, et al.).

The structure of Carroll is completely different from either that of Applicants' claimed invention, or that of Katsumata, et al. As will be appreciated, nothing in Carroll would have taught or suggested wrapping Katsumata, et al's outer conductor 113 at a wrapping angle exceeding 45°.

Carroll discloses center conductor 1 surrounded by insulator layer 2. Carroll then teaches placement of an outer conductor 3 about the insulator layer 2. Over the outer conductor 3, we come to mechanical or metal braid layer 4 that, in turn, is covered by a plastic separator 5. Over top of the separator 5 is wrapped a spiraled, and as Carroll describes it, a "strong, rigid wire 6". To complete the structure of Carroll, thereafter, another mechanical braid 7 is provided over top of the rigid wire 6, and finally a plastic outer jacket 8 is formed over the braid layer 7.

To those of ordinary skill in the art, Carroll teaches nothing further about the structure of the outer conductor 3 other than what was available as prior art in Carroll's time. In particular, as to the outer conductor, column 2, lines 57-59 of Carroll simply advises those of ordinary skill in the art to place the outer electrical conductor 3 "about insulation 2 by methods and processes well known in the art for that purpose."¹ Therefore, Carroll's outer conductor 3 would not have taught or suggested, to those of ordinary skill in the art that Katsumata, et al.'s outer conductor 113 should have a greater than 45° wrapping angle. Carroll's wire 6 does not remedy this deficiency.

Carroll describes specifics of the rigid wire 6. According to Carroll, wire 6 is "closely spiraled at a relatively steep angle of lay, such as 45° or greater from the axis of the cable, preferably 60° or greater around the coaxial transmission line, outside of the outer conductor 3 or shield of the basic coaxial transmission line, but inside a protected plastic outer jacket 8." See column 2, lines 29-39 of Carroll. The problem with the present rejection is that those of ordinary skill in the art would not have applied Carroll's teachings regarding rigid wire 6 to modification of the outer conductor 113 of Katsumata, et al. This is because the clearly stated purpose of Carroll's rigid wire 6 is to maintain the mechanical structure of Carroll's coaxial cable. The rigid wire 6 "provides crush and kinking resistance.", as per column 1, line 67. In this way, Carroll achieves a coaxial cable which,

¹ The application that issued as the Carroll patent was filed nearly one year before the application that issued as the Katsumata, et al. patent. Moreover, Carroll issued nearly one year before Katsumata, et al. issued. The teachings of Katsumata, et al. would not have been available to the inventor of the Carroll patent.

as described at column 2, lines 7-16, and column 4, lines 12-23, is crush, kinking, and torque resistant.² In short, it is ruggedized cable that can have smaller diameter and smaller weight than coaxial cables of the prior art (to Carroll).

The conclusion that Carroll would not have suggested modification of Katsumata, et al.'s outer conductor 113 as expressed above is corroborated by the introductory paragraphs in the Carroll patent. In his BACKGROUND OF THE INVENTION section, Carroll specifically reminds those of ordinary skill in the art that it is the inner conductor (1 in Carroll) and the outer conductor (3 in Carroll) that determine the electrical characteristics.³ Carroll simply would not have been regarded by those of ordinary skill in the art as teaching or suggesting a wrapping of the outer conductor at a winding angle exceeding 45° in order to determine the impedance properties for a coaxial cable. Such teaching does not come to those of ordinary skill from a rigid wire 6 disclosed to improve the mechanical structure of the cable rather than its electrical properties. Thus, those of ordinary skill in the art simply would not have looked to Carroll's rigid wire 6 for teaching related to the electrical properties of the cable.

For the reasons set forth above, Applicants courteously urge that Carroll simply does not remedy the deficiencies of Katsumata, et al., or any other of the several patents cited against various of the rejected claims. To those of ordinary skill in the art, Carroll simply would not have taught or suggested modification of the outer conductor to ensure that it, not a subsequently wrapped rigid wire for mechanical ruggedization, would be set at a wrapped angle exceeding 45° with respect to the axis of the coaxial cable. For these reasons, each of the separate rejections to the group of claims 1, 10, 14, 16, 19-22, 25-27 and 30; the rejection of the group of claims 4, 6, 17, 24 and 29; the rejection to the group

² Carroll's addition of the braided wire over the spirally wrapped rigid wire "provides torque resistance, as well." as per the sentence bridging column 1, line 67 through column 2, line 2 of Carroll.

³ In particular, Carroll continues that it is the "ratio of the diameter of the inner and outer conductors and the dielectric constant of the material separating them that determines cable impedance and must be maintained within tight tolerances." (See column 1, lines 25-28.)

of claims 5,7 and 18; the rejection of claim 8; the rejection of claim 11; and the rejection of claim 33 is overcome. Withdrawal of each of these rejections courteously is solicited.

In addition to the deficiencies of Carroll in connection with Katsumata, et al. and the other applied art as discussed above, Applicants courteously urge that the rejections, to the extent that they rely on the Carroll patent, improperly are based upon hindsight. The rejections likewise must fail for this reason.

As discussed in the foregoing, Carroll, in discussing and introducing rigid wire 6, is concerned with the mechanical properties of his resulting coaxial cable. Wire 6 is not directed to improving or modifying the electrical properties, particularly impedance of the cable. On the other hand, the Katsumata, et al. patent makes no reference to resistance to bending and kinking, and therefore makes no reference to structure to prevent such. It is not seen that Katsumata, et al. refer to such preventive structure as being provided by their helically wrapped outer conductor 113. As such, Applicants courteously submit that there is no teaching, suggestion or motivation provided by either Katsumata, et al. or Carroll to support their asserted combination. For these reasons, it respectfully is urged that the combination of Carroll with Katsumata, et al. is based upon hindsight gained from Applicants' own teachings as set forth in their original patent disclosure.

In view of the foregoing amendments and Remarks, it is courteously urged that all of the claims are allowable and that this application now is in condition for allowance. Favorable action in this regard earnestly is solicited.

Respectfully submitted,

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